THE INFLUENCE OF AFFECT-STIMULI ON SUBSEQUENT PERFORMANCE

By
HERMAN IVAN LEVIN

A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL OF
THE UNIVERSITY OF FLORIDA
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA
August, 1958

ACKNOWLEDGMENTS

The author wishes to thank the members of his supervisory committee: Dr. James C. Dixon, Chairman; Dr. Rolland H. Waters; Dr. Richard J. Anderson; Dr. Elmer D. Hinckley; and Dr. Albert M. Barrett for the interest shown and the effort expended in the production and development of this dissertation.

To my friends and fellow graduate students, Robert Procter, Denis O'Donovan, Charlotte Ince, who in one way or another have contributed immeasurably to this work, also my sincerest thanks and deepest gratitude.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

The presentation of a stimulus to influence the responses of a subject to subsequent stimulation is an experimental situation frequently encountered in psychology. Experiments in such diversified areas as learning, transfer, motivation, and perception have all used this procedure. The present experiment conforms to this general approach by investigating the influence of affect-stimuli upon behavior in a subsequent task situation. It attempts to find an answer to the question—Does the response of a subject to a standardized task differ in either speed or accuracy when the task follows on one occasion a pleasant stimulus, on a second occasion a neutral stimulus, and on a third occasion an unpleasant stimulus?

Recent Literature

The literature concerning the influence of affect on future performance can rather arbitrarily be divided into those studies which are most concerned with the perceptual variables of performance and those which are most concerned with the response variables of performance.

Influence of Affect on Perceptual Variables of Performance

Since the work of Sanford (10) on need in perception, it has become more and more apparent that psychological factors can and do

influence the subject's perception of external stimuli. Stimuli may, within the bounds placed by reality factors, be selected on the basis of the subject's needs, desires, values, and fears (4). Pleasant, valued, or need-related stimuli tend to be perceived more readily than do neutral stimuli (4). Unpleasant, threatening, or taboo stimuli tend in general to be perceived less readily—though there is considerable evidence for wide individual variation in the perception of unpleasant stimuli (4).

The affective nature of the stimulus not only influences the perception of the affect-stimulus itself, but also tends to influence the perception of other stimuli occurring in the same or in immediately succeeding fields. Affect-stimuli seem to impose "severe limits . . . upon the breadth and character of perception" (1). Neutral stimuli in the same or in immediately succeeding fields will be less adequately perceived (1). A task to be performed in relation to these stimuli, it may be assumed, would be hampered or left undone. Two studies have been found in the literature that are concerned with the perception of neutral stimuli in affective fields.

McGinnies (7) tested the influence of unpleasant stimuli on the thresholds of subsequently presented neutral stimuli in an attempt to demonstrate the operation of motivational factors in perceptual defense. His subjects were presented eight task words—four following the presentation of taboo words and four following the presentation of neutral words. The task words were equated for frequency and neutrality. The

recognition thresholds for task words were significantly higher when they followed taboo words than when they followed neutral words.

Soper (11) attempted to demonstrate Combs' hypothesis that the presentation of stimuli which are pleasant or unpleasant to the individual result in a decreased ability to perceive other details in the perceptual field. He presented his subjects with three sets of typed word lists arranged so that in one set of lists every fifth word was pleasant; in a second, every fifth word was neutral; and in a third, every fifth word was unpleasant. After one-minute presentations of the lists, the subjects were asked to recall as many words as possible. Results in general were in the predicted direction; that is, a significantly greater number of field words were reported from the neutral than from either the pleasant or unpleasant lists.

The Influence of Affect on Response Variables in Performance

Two areas of research concerning the influence of affect on response variables here converge. One of these areas is the influence of reports of previous "success" or "failure" on performance; the other is the influence of affect-stimuli on associations to future stimulus words on the Word Association Test.

Studies on "success" and "failure" tend to show a deterioration in performance after failure experiences; improvement in performance after success experiences. These effects occur both in the learning of verbal material and in the performance of psychomotor tasks. The expected effects, however, are not always the obtained results. Several

studies even show improvement under failure conditions. Lazarus (6), in summing up the review from which this material was obtained, states that the nature of the task, the kinds and amount of stress, individual differences, and the measures of efficiency must all be taken into account in predicting the influence of affect on performance.

Both Jung (5) and Rapaport (9) in their experiences with the clinical application of the Word Association Test have observed a perseverative influence of emotionally toned words on the associations of subjects to subsequent stimulus words. Perseverative influences are stated as being observed in the inappropriate repetition of the association word and/or in an increase in association time. Hull (3) attempted as a minor part of his experiment on the diagnostic ability of complex signs to test perseveration as one of his complex signs. He found that neither of the clinically observed effects of perseveration occurred in his subjects. The experimental design, not being specifically set up to test perseverative influences, did not, however, permit an adequate test of this phenomenon. The clinical observations of Jung and Rapaport in this area remain untested.

Hypotheses

Studies in both the areas of perception and performance tend to indicate that unpleasant stimuli will negatively influence performance on a subsequent task. Disagreement occurs between studies in the two areas on the influence of pleasant stimuli on subsequent performance. Since, however, both measures in the present experiment are predominately

performance measures, it is expected that the effects of pleasant stimuli will be to facilitate subsequent performance. The hypotheses will, however, be cast in the null form.

Hypothesis 1.—There will be no relation between the affective tone of a stimulus, whether pleasant, unpleasant, or neutral, and the speed of the subject's response to a standardized task which immediately follows upon the presentation of the stimulus. That is to say, when the speed of reaction to a standardized task which follows an unpleasant stimulus is compared with the speed of reaction to the same standardized task when it follows either a neutral or a pleasant stimulus, no statistically significant differences are expected to occur.

Hypothesis 2.—There will be no relation between the affective tone of a stimulus, whether pleasant, unpleasant, or neutral, and the accuracy of the subject's responses to a standardized task which immediately follows upon the presentation of the stimulus. That is to say, when the accuracy of reaction to a standardized task which follows an unpleasant stimulus is compared with the accuracy of reaction to the same standardized task when it follows either a neutral or a pleasant stimulus, no statistically significant differences are expected to occur.

To test the above hypotheses, subjects were asked to spell aloud a series of three-consonant nonsense syllables following pleasant, unpleasant and neutral words. Measures of speed and accuracy of this response were obtained.

Definition of a Term

At this point note should be taken of the terms used to denote the subject's speed of reaction to the task following the affect word. Both the terms speed of reaction and reaction time have previously been used by experimenters to denote the temporal interval between a stimulus and the response. In this experiment these terms are used to denote the time it takes the subject to perform the task following the affect-stimulus.

CHAPTER II

PROCEDURE

Experimental Design

To test the hypotheses, it was necessary to go through the following steps in apparatus construction and preparation: (a) the affect-stimuli had to be selected; (b) the nonsense-syllable tasks had to be likewise selected; (c) slides containing one affect-stimulus and one nonsense-syllable task had to be constructed; (d) the slides had to be arranged in a particular order for presentation to the subjects; (e) an instrument to present the slides to the subjects had to be obtained; (f) apparatus that would record the speed and accuracy of response to the nonsense-syllable tasks had to be constructed; and (g) the apparatus had to be wired so the experimenter could control from one switch the presentation of the material and the operation of the instrument that would record the speed of the subject's response to the task.

Selection of Affect-words

Affect-words had to be selected which would show a consistent tendency to fall into either pleasant, neutral or unpleasant categories when ranked by the judges. There was no need to equate the words in the three affect-categories as to length or frequency since it is the speed and accuracy of nonsense-syllable verbal report, rather than report of

the affect-stimulus, which is the subject's task.

The affect-words were obtained by presenting five graduate students in psychology with a list of 394 words. These words were chosen from the Thorndike Word List (12) with the intention of obtaining words which were likely to have pleasant, unpleasant, or neutral connotations. Each of the five graduate students ranked the 394 words on a five-point scale. The scale points were: (1) very pleasant, (2) mildly pleasant, (3) neutral, (4) mildly unpleasant, and (5) very unpleasant. The average rank for each word was obtained. Any word which had an average rank of at least mildly pleasant affect-tone and which was not ranked by any judge as being unpleasant was considered for use as a pleasant affect-word. Any word which had an average rank of at least mildly unpleasant affect-tone and which was ranked by no judge as pleasant was considered for use as an unpleasant affect-word. Only those words ranked by all five judges as neutral were considered for use as neutral words. Twenty-five pleasant, 25 neutral, and 25 unpleasant affect-words were chosen randomly from those meeting the above criteria and were used in the experimental slides. In addition, three pleasant, three unpleasant, and three neutral words were selected to be used as part of the practice slides. Practice slides were presented prior to the experimental slides in an attempt to reduce practice effects which are likely to occur in this type of experiment, and which would affect the dependent variables of speed and accuracy.

Judges' ranks of the affect-words used in the experimental slides

can be seen in Appendix I.

Nonsense-syllable Tasks

The affect-stimuli having been chosen, it was then necessary to choose a standardized task upon which to test their effects. A difficulty then arose in task selection. If the same task were repeated after each affect-word, the practice effects would likely be so great that they would overshadow the influence of the affect-words themselves. If, on the other hand, different tasks were to follow each affect-word, differences in task difficulty would likely be so great that, again, the influence of the affect-words would be overshadowed. A compromise was settled upon, using 25 different tasks, so that each task would follow one of the 25 pleasant words, one of the 25 neutral words, and one of the 25 unpleasant words. The task difficulty was therefore equated by having the same 25 tasks occur in each of the three affect-groups. The effects of practice, which would have been great with the repeated presentation of the same task, were minimized by the fact that there were 25 different tasks to which the subject was to respond. Each subject, then, received a total of 75 slides and made 75 measurable responses.

To consitutute the tasks nonsense syllables were chosen. They were chosen because their degree of familiarity could be controlled; because estimates of accuracy and speed of their production could be fairly easily measured; and because they were a convenient material with which to work. The fact that their degree of familiarity could

be controlled was most important to this experiment; it served to narrow the range of difficulty among tasks without increasing the effects which might result from practice. Under these conditions, the influence of affect alone was more likely to be observable.

Eighty-four nonsense syllables consisting of three consonants were chosen from Witmer's (13) list of association values of consonant nonsense syllables. The range of association values from which the nonsense syllables were chosen was from 0 per cent to 25 per cent. Three nonsense syllables constituted a task. Nine of the nonsense syllables were used to construct the three tasks for the practice slides; 75 of the nonsense syllables were used to construct the 25 tasks for the experimental slides.

Preparation of Slides

Affect-words and nonsense syllable tasks were randomly assigned to one another. Again, it should be noted the stipulation was that each task would follow one unpleasant stimulus, one neutral stimulus, and one pleasant stimulus. The physical preparation of the slides consisted of typing the affect-word and the three nonsense syllables in a single column on 3-1/2 x 4 inch sheets of thin drawing paper. Each sheet was then placed between two thin pieces of glass to make a slide. Appendix II shows the 25 experimental tasks preceded by their affect-words.

Arrangement of the Slides for Presentation to the Subjects

Since subjects tend to become more efficient in handling a

repeated similar situation, the slides were arranged in a stratified random order. Stratification was based on the assumption that in a list in which three variables are to be distributed among 75 positions, one run of four in a row, three runs of three in a row, eight runs of two in a row, and 46 runs of one in a row can be expected to occur. Pleasant, unpleasant and neutral stimuli were assigned randomly to the various runs. The one stipulation made was that 25 of the stimuli be neutral, 25 pleasant, and 25 unpleasant. The result of assigning affect-stimuli to runs provided one run of four, one run of three, two runs of two, and 14 runs of one for the neutral stimuli, and one run of three, three runs of two, and 16 runs of one for both the pleasant and unpleasant stimuli.

Runs were assigned to each of the eight deciles and to each of the units of each of the deciles from a table of random numbers. For instance, the experimenter would begin with the run of four neutral slides and look in a table of random numbers to determine the appropriate decile. The number seven occurred. The run was, therefore, to be located in the seventh decile. The experimenter would then look again into the table of random numbers to determine the unit position in the decile of the run. The number two occurred and the run was, therefore, to begin in the second unit of the seventh decile, or the number 62. Two restrictions were placed on the ordering: (1) no run could succeed or precede another run of the same affective tone; and (2) in each third of the 75 slides, eight words of one affect, eight words of a second

affect, and nine words of the third affect were to occur.

The specific affect-words were then placed randomly in the appropriate positions. Here another stipulation was made. To assist in controlling practice effects, no two similar sets of nonsense syllables could occur in succession.

Apparatus

A projector that could handle slides of the appropriate dimensions was obtained to project the slides on a projector screen.

A tape recorder was used to record the subject's report of the nonsense syllables. Any errors, omissions or insertions in the spelling of the nonsense syllables was considered an error.

A continuous voice key was constructed to measure the length of time it took the subject to reproduce the nonsense syllables. Sounds spoken into a microphone attached to the voice key closed the circuit, and when the sounds ceased, the circuit was opened. By connecting this apparatus to a signal magnet, by attaching a writing pen to the signal magnet, and by placing the writing pen on a kymograph in motion, a temporal pattern of speech sounds was obtained. Appendix III contains a circuit diagram of the voice key.

The kymograph speed was regulated at 225 centimeters per minute. When the speed was measured in millimeters, speed could be recorded to 27/1000 of a second. (Measurements of speed will be reported in millimeter units without converting them into seconds.)

The Wiring of the Apparatus

The apparatus was connected in such a way that the experimenter could control the projector, kymograph, and voice key by means of a five-pole, two gang switch. It was arranged so that, in position 1, the tape in the kymograph was stationary, the pen was in position "a", the projector and the voice key were off; in positions 2 and 3, the tape began to move, the pen rose into position "b", the projector and the voice key remained off; in position 4, the tape continued to move, the pen fell back into position "a", the projector and voice key began to work. While in position 4, each time the voice key was activated the pen moved into position "b"; each time it was deactivated it returned to position "a". Thus in position 4, a graphic representation of the subject's speech patterns was obtained. Position 5 was a check position to test the workings of the voice key.

Appendix IV contains a circuit of the switch connections for the two gangs.

Subjects

Seventy-five male undergraduate students from the University of Florida were used as subjects. Most, though not all, were volunteers from the beginning psychology courses.

Method

The subjects were brought into the room and the tape recorder was started. Each subject was then seated facing the projector screen

and handed the microphone. A few remarks were made by the experimenter in an attempt to make the subject feel more comfortable. The experimenter then read the following instructions to the subject:

"You are to watch the screen each time I say 'ready.' Soon after, a slide will be projected on the screen. This slide will consist of one familiar word and three nonsense syllables. You are to read the familiar word to yourself and then spell out loud into the microphone the nonsense syllables. Spell the nonsense syllables as fast as you can. If you make a mistake, don't stop but go on to the next letter. For instance, a slide is projected on the screen with the word THERE appearing on it and underneath in a column appear the nonsense syllables ZFT, QHN, MTC. You are to read the word THERE to yourself and then spell out loud into the microphone Z-F-T, Q-H-N, M-T-C. Do you understand"?

If any questions were asked, further explanations were given.

The 84 slides, including the nine practice slides and the 75 experimental slides, were then presented to the subject.

After the presentation of the slides, the subject was placed at a desk with the list of 75 affect-words before him. The subject was then given the following instructions:

"I want you to rank the words on this sheet of paper in one of five categories. If the word has a very pleasant ring or association connected with it, circle the letter P. If a mildly pleasant association, circle the first dot. If the word has neither a pleasant nor unpleasant

association connected with it, but a neutral one, circle the letter N. If the word has a mildly unpleasant association, circle the second dot. And finally, if the word has a very unpleasant association, circle the letters UP. Are there any questions"?

The subject then rated the affect-words in the five possible categories.

This latter procedure, the rating of the experimental affect-words by the subject, was included to determine the similarity between subjects' and judges' ratings of the affect-words. If the ratings are markedly dissimilar, then the independent variable of affective tone is confounded and the experimental results questionable.

CHAPTER III

RESULTS

The Correlation between Judges' and Subjects' Ratings

The mean of the affect-ratings of the judges and of the subjects for each of the 75 experimental words can be seen in Appendix I. A rank order correlation of .94 was obtained between the two sets of data. Subjects' and judges' ratings of affect-words were, therefore, highly similar in this study.

The Influence of Affect-stimuli on Speed of Reaction

Table 1 contains the results of a triple classification, complex analysis of variance for task speed. Since 75 subjects were presented with 25 tasks in each of three different affect-situations, the analysis of variance has three categories in one variable (pleasant, unpleasant, and neutral affect), 25 categories in another variable (each of the 25 sets of nonsense syllables) and 75 categories in a third variable (each of the 75 subjects).

The 75 individuals differed significantly from one another in speed of reaction to the tasks at less than the 1% level of confidence. As expected, one individual reacted more swiftly to a situation of this nature than did another.

TABLE 1

RESULTS OF THE COMPLEX ANALYSIS OF VARIANCE FOR SPEED

Source	Sum of Squares	Degrees of Freedom	Variance Estimate	Significance Level
Affect	22.64	2	11.32	Not significant
Tasks	5657.18	24	235.72	Below 1%
Subjects	41474.88	74	560.47	Below 1%
Interaction: tasks and subjects	11191.50	1776	6.30	Below 1%
Interaction: tasks and affect	443.38	48	9.23	Below 1%
Interaction: affect and subject	473.72	148	3.20	Not significant
Triple interaction	13357.90	3552	3.76	
Total	72621.20	5624		

Nonsense-syllable tasks also differed significantly from one another in their tendency to influence the speed of the subjects' reactions. This was so, despite the attempts to control task difficulty on the basis of familiarity. Certain nonsense-syllable groups, regardless of the affect-stimulus which preceded them, were reacted to more slowly by the subjects than were other nonsense-syllable groups.

The results of the test of the first hypothesis are rather complex. Stimuli of different affect-tone did not significantly influence the speed of reaction to subsequent tasks, when these tasks differed

significantly from one another. However, when affect-tone and the nature of the task were taken jointly into consideration (the interaction of task and affect), significant findings below the 1% level were obtained. The experimental answer, then, is that pleasant, unpleasant and neutral stimuli influenced the task differentially when the nature of the task was taken into consideration. When compared with neutral stimuli, unpleasant stimuli slowed the response and pleasant stimuli speeded the response.

Concerning the other interactions, the interaction between tasks and subjects was significant; the interaction between affect and subjects was not significant.

The Influence of Affect-stimuli on the Accuracy of Report

Table 2 contains the results of a triple classification, complex analysis of variance for the accuracy of the subjects' reports. Since the same number of measurements were made on the accuracy of the subjects' responses as on the speed of the response, again the analysis of variance has three categories in one variable (affect-stimuli), 25 categories in another variable (nonsense-syllable groups), and 75 categories in a third variable (subjects).

Individuals again differed significantly from one another (below 1% level of confidence) in their reactions as measured by accuracy of report; that is, some subjects tended to be more accurate than others. Nonsense-syllable groups also again differed significantly from one another in the accuracy of the reactions which they tended to elicit. Some

nonsense-syllable groups tended to elicit more errors than did others.

TABLE 2

RESULTS OF THE COMPLEX ANALYSIS OF VARIANCE FOR ACCURACY

Source	Sum of Squares	Degrees of Freedom	Variance Estimate	Significance Level
Affect	.96	2	.48	Not significant
Tasks	38.23	24	1.59	Below 1%
Subjects	61.22	74	.83	Below 1%
Interaction: tasks and subjects	434.12	1776	.24	Below 1%
Interaction: tasks and affect	17.74	48	.37	Below 1%
Interaction: affect and subjects	28.03	148	.19	Not significant
Triple interaction	637.27	3552	.18	
Total	1217.57	5624		

The second hypothesis—that differing affective stimuli will not result in varying accuracy on the tasks—cannot be rejected, when the tasks vary significantly among themselves. However, when affective tone and the inherent task differences were taken jointly into consideration (interaction of task and affect), significant differences below the 1% level of confidence were obtained. Both pleasant and unpleasant stimuli elicited significantly fewer errors than did neutral stimuli.

Concerning the other interactions, the interaction between tasks and subjects was significant; the interaction between affect and subjects was not.

Comparison of the Two Complex Analyses of Variance

If we regard fast and accurate report as task efficiency, then efficiency varied with the response measure used (when task differences also were taken into consideration). When the speed of reaction to the nonsense syllables is taken as the measure of influence, unpleasant stimuli instigate the longest reaction times (average 15.02 mm. per task per subject); neutral stimuli the next longest (average 15.00 mm per task per subject); and pleasant stimuli the shortest (14.88 mm per task per subject). When accuracy of report of the nonsense syllables is taken as the measure of influence, more errors were made on nonsense syllables following neutral words (average .187 per task per subject); than on nonsense syllables following unpleasant words (average .161 per task per subject) or pleasant words (average .157 per task per subject). The results indicate that while unpleasant stimuli, when compared with neutral stimuli, resulted in slower reactions, they also produced more accurate reactions. Pleasant stimuli resulted in faster reactions and more accurate reports when compared with both neutral and unpleasant stimuli.

Nature of the Task that Interacts with Affect to Produce Significant Results

It has been noted above that the interaction of task differences and affective tone was significant. The following data are presented in an attempt to test the assumption that the significant interaction between task and affect is a function of task difficulty. If task difficulty is the important property of the task in the interaction effects, the responses to the ten hardest tasks would be more likely influenced in the direction expected from the obtained results than would the responses to the ten easiest tasks. This would mean (a) that, for speed, responses following pleasant stimuli would be the shortest; responses following unpleasant stimuli the longest; (b) that, for accuracy, responses following pleasant stimuli would contain the least errors; responses following neutral stimuli would contain the most.

Both sign tests of significance and *t* tests of significance were obtained for the ten hardest and the ten easiest tasks comparing the speed and accuracy of responses following each of the three different affects (for any one sign test or any one *t* test, of course, only tasks following two different affects were compared). The results were ambiguous, at least as far as the interpretation is concerned. Trends were of such a nature that the more difficult tasks tended to fall in the expected order more frequently than did the easier tasks for both measures of speed and accuracy. The sign tests only tended to confirm the trends

for speed (the comparison between neutral and pleasant and between pleasant and unpleasant were significant for difficult tasks below the 5% level of confidence). The *t* tests showed no significance for either measure of response either for difficult or easy tasks. Any interpretation of task difficulty as being the property of the task contributing to the significant interaction between affect and task would have to be made with extreme caution.

CHAPTER IV

DISCUSSION

Lazarus (6), as has been noted in the introduction, states that the nature of the task, individual differences, and measures of efficiency, as well as the kind and degree of affect influence the results of a subject's performance on a task following affective stimulation. This is what tended to happen in this study. The degree of affect is mild. When this is so and tasks vary greatly among themselves, affect does not seem to influence performance. When, however, the nature of the task is taken into consideration, even this mild degree of affect becomes important in the efficiency of production of the response. When different response measures of efficiency are used, a given affect, unpleasant in nature, may have at one and the same time facilitating effects on one type of response measure and detrimental effects on another type of measure. The only one of the possible determinants of the task performance mentioned by Lazarus that is not observed in this study to differentiate reactions is individual differences in the reaction to affect-tones (the interaction between affect and subjects is not significant). This could easily be due to the mildness of the affective stimulation.

Interaction of Affect and the Nature of the Task

Mild affect, when considered alone, does not influence either the speed or accuracy of the performance of a subject on a series of tasks which differ widely among themselves. When, however, the nature of the task is taken into consideration the affect does seem to influence the performance. A similar situation has occurred previously in the literature. This was encountered by Postman and Schneider (8) in their study comparing the relative effects of value and frequency on word threshold. These authors sum their results thus, "We find frequency of word usage is significant whereas value in and of itself is not. The interaction between frequency and value is, however, significant, i. e., the effect of value rank on duration thresholds depends on the level of word frequency." The obvious correlate of word frequency in the present study is task difficulty. Task difficulty, however, did not unambiguously allow for the rejection of the null hypotheses. Though trends were in the appropriate direction (performance on the more difficult tasks occurring more in line with the order predicted on the basis of the obtained results), variations among tasks were too great for these trends to reach significance.

Influence of Varying Degrees of Affect on Performance

Only one degree of affect was used in this study, a very mild one. Previously in the literature much greater degrees of affective stimulation have been used—to the point of emotional arousal. To fit

the results of this study into this body of literature, Duffy's (2) activation theory of emotion is used. Each of three excerpts from her work is followed by an attempt to integrate the results of this study.

"The chief point in regard to arousal, . . . , is that arousal occurs on a continuum, from a low point during deep sleep to a high point during extreme effort or great excitement, with no distinguishable break for such conditions as sleep or 'emotion.'" Our affective stimuli are somewhere between the lower end and the middle of the continuum. In addition to the factor of the waking state, performance situation, etc., pleasant and unpleasant stimuli can only be slightly more activating than neutral stimuli.

"When performance has been observed to vary under certain conditions . . . , it is suggested that the variation may be due, at least in part, to the effect of varying degrees of arousal. The disorganization of responses frequently reported during 'overmotivation' or 'emotion' . . . may be conceived of as resulting in part from too high a degree of arousal. Such a condition would be represented at one end of the U-shaped curve. A similar disorganization of responses, found sometimes during drowsiness or fatigue, would be represented at the other end of the curve showing the relationship between arousal and performance." One would suppose that mild affect, pleasant or unpleasant in nature, would increase performance about equally—since both would increase activation approximately the same amount. However, it was found that pleasant and unpleasant stimuli have different effects on performance

when speed is the response measure. To account for the results, another of Duffy's terms "direction" of behavior needs to be defined.

"'Direction' in behavior refers to the fact that the individual does 'this' rather than 'that', or responds positively to certain cues and negatively to others." Pleasant stimuli produce positive responses, unpleasant stimuli, negative ones. Probably in an activation theory such as Duffy's a much greater amount of attention, than is at present placed, should be paid to these directional factors.

Differential Effects of Unpleasant and Neutral Stimuli for Different Response Measures

When speed is the response measure, unpleasant stimuli have a negative effect on performance when compared to neutral stimuli. When accuracy is the response measure, unpleasant stimuli have a positive effect on performance. This tends to go counter to the experimental results reported by Lazarus (6) that in stress situations (assumed to be of unpleasant affective nature) speed increases while accuracy decreases. It does, however, fit in with his theorizing that depending upon the variables involved in the situation, such as expectancy, stress will either increase or decrease in particular performance measure. It is suggested that, though speed and accuracy were both stressed in the instructions to the subjects, accuracy was emphasized more by the subjects. Accuracy, rather than speed, is what has previously been stressed in similar situations. Of the two variables which might be detrimentally affected by unpleasant situations, the less "important"

of the two is the one which is hampered.

CHAPTER V

SUMMARY

The purpose of this experiment was to observe the influence of affect-stimuli on the performance of an immediately following task. The stimulus material, presented on a projector screen to 75 subjects, consisted of one affect-word (the affect-stimulus) followed by three-consonant nonsense syllables (the task). Affect-words--25 pleasant, 25 neutral, and 25 unpleasant--were chosen on the basis of the judgments made by five graduate students in psychology. Confirmation of the affective nature of the stimulus was obtained through the judgments of the 75 subjects. Each of the 25 tasks on one occasion followed an unpleasant stimulus, on a second occasion followed a neutral stimulus and on a third occasion a pleasant stimulus.

The instructions were for the subject to first read the affect-stimulus word to himself, then to spell aloud as fast and accurately as possible the nonsense syllables. The measure of the influence of affect-stimuli on performance was the speed and accuracy of the subject's spelling of the nonsense syllables.

The results show that the influence of affect on the responses to the task is a complex one. Both the nature of the response measure and the nature of the task have to be taken into consideration.

Affect-stimuli considered alone did not influence the subject's performance on the tasks. When, however, the affect-stimulus and the nature of the task for the separate measures were taken jointly into consideration, significant results below the 1% level of confidence were obtained. In comparison with the influence of neutral stimuli on the task, unpleasant stimuli, when the response measure was speed, tended to hinder performance; pleasant stimuli tended to facilitate performance. When the response measure was accuracy, both pleasant and unpleasant stimuli tended to facilitate performance.

Task difficulty was investigated to determine if this was the task property that interacted differentially with the affect to produce differential results. Trends in the predicted direction were obtained, but they failed to reach significance.

APPENDIXES

APPENDIX I

COMPARISON OF AVERAGE AFFECT RANKINGS OF STIMULI BY JUDGES AND SUBJECTS. SCALE OF AFFECT RANGED FROM 1 FOR VERY PLEASANT; THROUGH 3 FOR NEUTRAL; TO 5 FOR VERY UNPLEASANT.

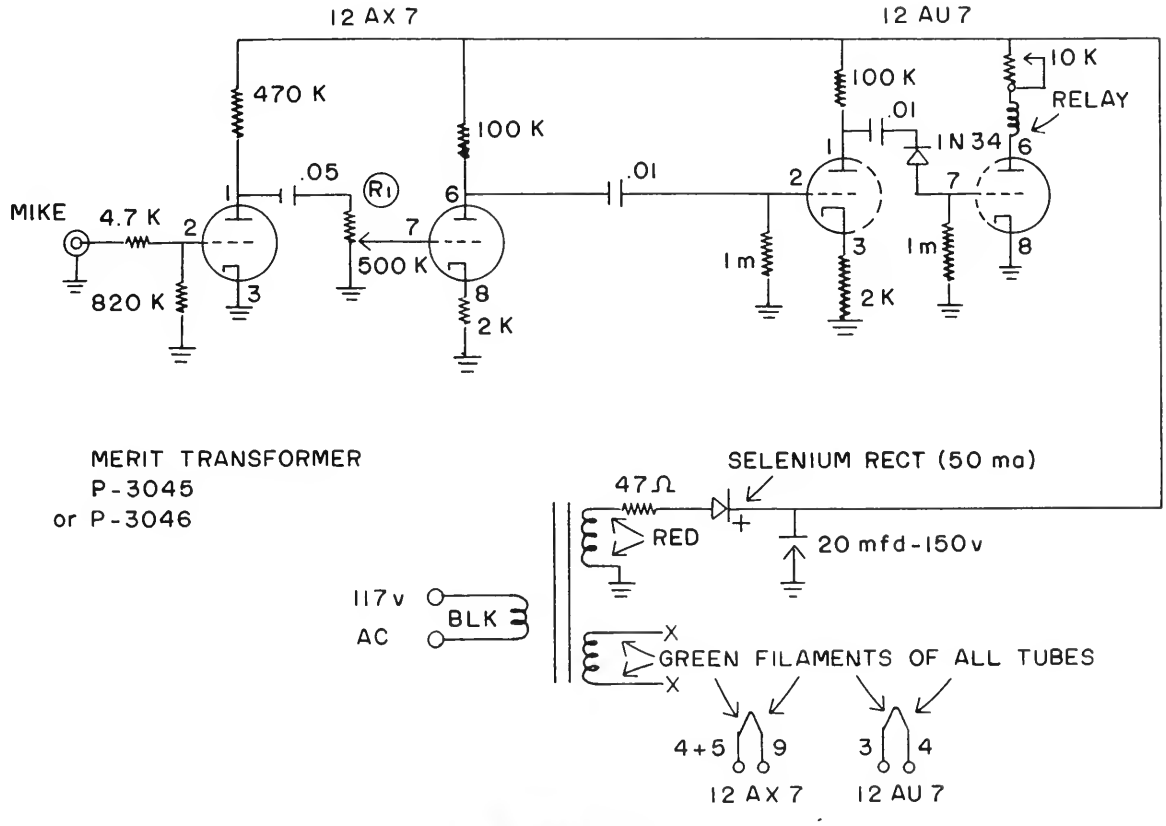
	Affect Word	Judge's Rank	Subject's Rank
1.	Fun	1.80	1.24
2.	Ecstasy	1.60	1.40
3.	Thrill	1.60	1.68
4.	Favorite	1.80	1.88
5.	Luxury	1.80	1.71
6.	Beautiful	1.40	1.39
7.	Popular	1.80	1.73
8.	Delightful	1.80	1.45
9.	Irresistible	1.80	2.23
10.	Pleasant	1.60	1.61
11.	Party	1.80	1.84
12.	Voluptuous	1.80	2.08
13.	Excellent	1.80	1.55
14.	Laughter	1.80	1.59
15.	Happy	1.20	1.51
16.	Delicious	1.60	1.63
17.	Humor	1.80	1.75
18.	Graceful	1.80	1.77
19.	Best	1.60	1.93
20.	Success	1.40	1.45
21.	Friendly	1.80	1.49
22.	Splendid	1.80	1.61
23.	Superb	1.60	1.55
24.	Smile	1.80	1.68
25.	Jolly	1.60	1.69
26.	Various	3.00	2.57
27.	Sort	3.00	2.92
28.	Type	3.00	2.77
29.	Number	3.00	2.97
30.	Carpet	3.00	2.83
31.	Because	3.00	2.97
32.	Term	3.00	3.40
33.	Wagon	3.00	2.88
34.	Assemble	3.00	2.73
35.	While	3.00	3.00
36.	Middle	3.00	2.96
37.	Similar	3.00	2.84
38.	Material	3.00	2.95
39.	Trace	3.00	2.92
40.	Cable	3.00	2.89
41.	Revolve	3.00	3.00
42.	Cube	3.00	2.92
43.	Bench	3.00	2.99
44.	Since	3.00	2.93
45.	During	3.00	2.97
46.	Declare	3.00	2.88
47.	Topic	3.00	2.91
48.	Circle	3.00	2.85
49.	Dozen	3.00	2.92
50.	Sample	3.00	2.88
51.	Torment	4.20	4.31
52.	Quarrel	4.20	4.32
53.	Failure	4.60	4.51
54.	Behead	4.20	4.47
55.	Slander	4.20	4.11
56.	Fear	4.20	4.30
57.	Unhappy	4.20	4.39
58.	Violate	4.20	3.78
59.	Murder	4.40	4.53
60.	Shame	4.60	4.19
61.	Angry	4.20	4.05
62.	Kill	4.40	4.29
63.	Argue	4.20	3.97
64.	Suicide	4.40	4.51
65.	Mutilate	4.40	4.51
66.	Molest	4.20	4.23
67.	Ugly	4.20	4.13
68.	Stupid	4.20	4.19
69.	Hate	4.60	4.51
70.	Lonely	4.40	4.28
71.	Blood	4.20	3.52
72.	Disgrace	4.20	4.39
73.	Freak	4.40	3.93
74.	Despise	4.20	4.27
75.	Massacre	4.20	4.47

APPENDIX II

STIMULUS MATERIAL: EXPERIMENTAL TASKS PRECEDED BY AFFECT-WORDS

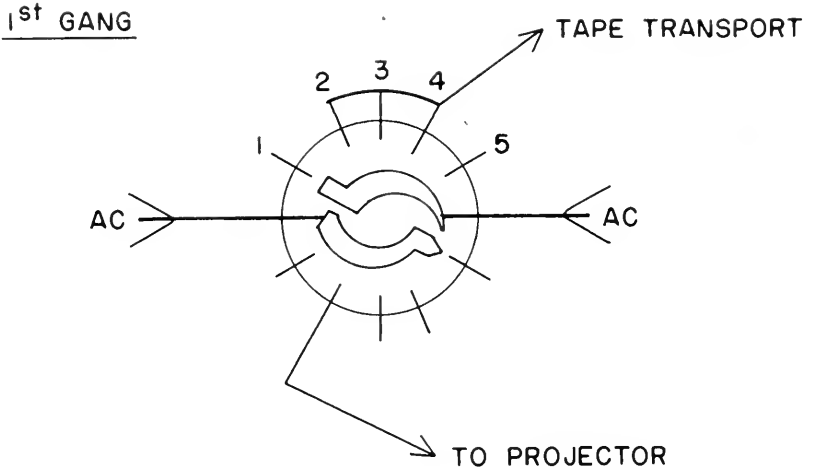
QUARREL	DECLARE	POPULAR	FAILURE	ASSEMBLE	SUCCESS
ZXJ	ZXJ	ZXJ	SGJ	SGJ	SGJ
CXJ	CXJ	CXJ	XZL	XZL	XZL
XJF	XJF	XJF	GXJ	GXJ	GXJ
BEHEAD	TOPIC	LAUGHTER	SLANDER	WAGON	FAVORITE
PJZ	PJZ	PJZ	QHX	QHX	QHX
FQJ	FQJ	FQJ	BJH	BJH	BJH
GZK	GZK	GZK	CQH	CQH	CQH
FEAR	DURING	IRRESISTIBLE	UNHAPPY	SINCE	SPLENDID
JHQ	JHQ	JHQ	CSF	CSF	CSF
ZKG	ZKG	ZKG	KXZ	KXZ	KXZ
XJQ	XJQ	XJQ	CGJ	CGJ	CGJ
VIOLATE	REVOLVE	PARTY	MURDER	TERM	SUPERB
JGP	JGP	JGP	BJS	BJS	BJS
KXB	KXB	KXB	QZM	QZM	QZM
FJH	FJH	FJH	GXC	GXC	GXC
MASSACRE	WHILE	SMILE	SHAME	BENCH	BEAUTIFUL
MZC	MZC	MZC	QXH	QXH	QXH
DJQ	DJQ	DJQ	XKB	XKB	XKB
MGQ	MGQ	MGQ	KMH	KMH	KMH
ANGRY	SAMPLE	FUN	KILL	VARIOUS	ECSTASY
RCJ	RCJ	RCJ	GKN	GKN	GKN
BFM	BFM	BFM	HFC	HFC	HFC
QJH	QJH	QJH	XZG	XZG	XZG
ARGUE	TRACE	LUXURY	MUTILATE	DOZEN	BEST
ZMF	ZMF	ZMF	SFM	SFM	SFM
JCF	JCF	JCF	DJX	DJX	DJX
ZQJ	ZQJ	ZQJ	ZBJ	ZBJ	ZBJ
SUICIDE	CIRCLE	HAPPY	MOLEST	SORT	EXCELLENT
RBM	RBM	RBM	TJH	TJH	TJH
GQC	GQC	GQC	BQJ	BQJ	BQJ
FBM	FBM	FBM	CFP	CFP	CFP
UGLY	SIMILAR	GRACEFUL	STUPID	MATERIAL	HUMOR
JSB	JSB	JSB	FHJ	FHJ	FHJ
TZH	TZH	TZH	ZJF	ZJF	ZJF
NPB	NPB	NPB	XQD	XQD	XQD

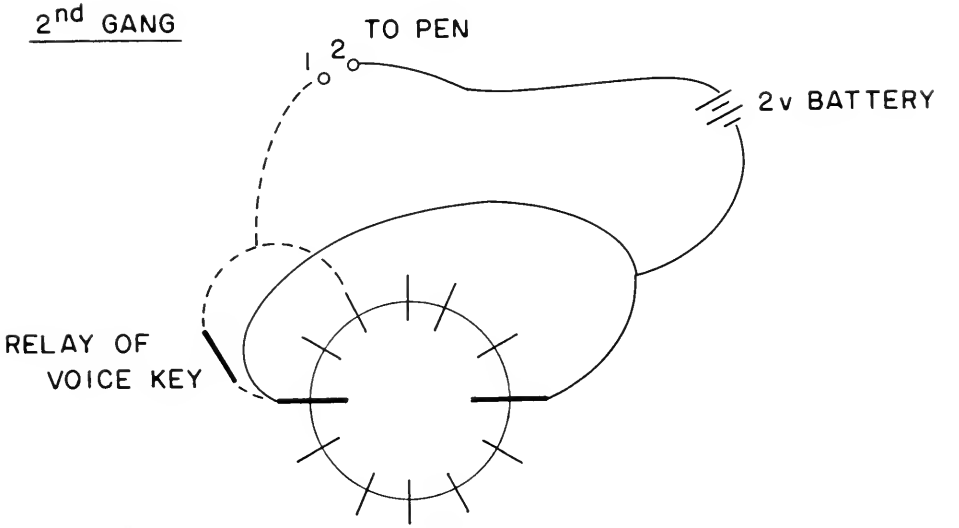
HATE	CUBE	DELIGHTFUL	LONELY	BECAUSE	DELICIOUS
QFZ	QFZ	QFZ	FHJ	FHJ	FHJ
ZGQ	ZGQ	ZGQ	ZJF	ZJF	ZJF
QJF	QJF	QJF	XQD	XQD	XQD
BLOOD	NUMBER	FRIENDLY	DISGRACE	MIDDLE	PLEASANT
PXJ	PXJ	PXJ	ZHL	ZHL	ZHL
JZH	JZH	JZH	FJC	FJC	FJC
HFM	HFM	HFM	LJS	LJS	LJS
FREAK	CARPET	THRILL	DESPISE	TYPE	JOLLY
KHF	KHF	KHF	DJZ	DJZ	DJZ
NQK	NQK	NQK	XFQ	XFQ	XFQ
XCZ	XCZ	XCZ	XZB	XZB	XZB
TORMENT	CABLE	VOLUPTUOUS			
XJS	XJS	XJS			
LJX	LJX	LJX			
TZK	TZK	TZK			



APPENDIX III

DIAGRAM OF CONTINUOUS VOICE KEY





APPENDIX IV

DIAGRAM OF WIRING OF SWITCH

BIBLIOGRAPHY

1. Combs, A. F. Intelligence from a perceptual point of view. J. abnorm. soc. Psychol., 1952, 47, 662-673.

2. Duffy, Elizabeth. The psychological significance of the concept of "arousal" or "activation." Psychol. Rev., 1957, 64, 265-275.

3. Hull, C. L., and Lugoff, L. S. Complex signs in diagnostic free association. J. exp. Psychol., 1921, 4, 111-136.

4. Jenkin, N. Affective processes in perception. Psychol. Bull., 1957, 54, 100-127.

5. Jung, C. G. Studies in word-association. London: William Heineman, 1918.

6. Lazarus, R. S., Deese, J., and Osler, Sonia F. The effects of psychological stress upon performance. Psychol. Bull., 1952, 49, 293-317.

7. McGinnies, E. Generalization of perceptual defense. J. abnorm. soc. Psychol., 1952, 47, 81-85.

8. Postman, L., and Schneider, B. H. Personal values, visual recognition and recall. Psychol. Rev., 1951, 58, 271-284.

9. Rapaport, D. Diagnostic psychological testing. Vol. 2. Chicago: Year Book Publishers, 1946.

10. Sanford, R. N. The effects of abstinence from food upon imaginal processes. J. Psychol., 1936, 2, 129-136.

11. Soper, D. A study of changes in the perceptual field in responses to the perception of pleasant and unpleasant stimuli. Unpublished doctoral dissertation, Syracuse Univ., 1952.

12. Thorndike, E. L. The teachers word book. New York: Teachers College, Columbia Univ., 1921.

13. Witmer, L. R. The association value of three-place consonant syllables. J. genet. Psychol., 1935, 47, 337-359.

VITA

Herman Ivan Levin was born in Pensacola, Florida, on April 23, 1932. He attended the public schools of Pensacola and graduated from Pensacola High School in June, 1949. In September of that year he entered Emory University. Two years later he transferred to Lousiana State University, and in June, 1953, he received his Bachelor of Arts degree from this university. In September, 1953, he matriculated at Teachers College, Columbia University and received his Master of Arts degree in June, 1954. In September, 1955, he entered the University of Florida. There he has remained; except that during the last year he has been in the Veterans Administration clinical psychology training program at Gulfport, Mississippi.

This dissertation was prepared under the direction of the chairman of the candidate's supervisory committee and has been approved by all members of the committee. It was submitted to the Dean of the College of Arts and Sciences and to the Graduate Council and was approved as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August 9, 1958

E. T. Byrn
Dean, College of Arts and Sciences

Dean, Graduate School

SUPERVISORY COMMITTEE:

Chairman